

PTO 08-1058

CC=CN DATE=20001129 KIND=A
PN=1274584

THE APPLICATION OF PHOTOSYNTHESIS BACTERIA FOR MEDICINE HEALTH
PRODUCTS, THEIR MANUFACTURING METHOD AND PRODUCTS
[Guang he xi jun zuo wei yi yao bao jian pin de ying yong ji qi zhi
zuo fang fa ji qi chan pin]

Yang Mengjun, et al

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D.C. December 2007

Translated by: FLS, Inc.

PUBLICATION COUNTRY	(19):	CN
DOCUMENT NUMBER	(11):	CN 1274584A
DOCUMENT KIND	(12):	A
PUBLICATION DATE	(43):	20001129
APPLICATION NUMBER	(21):	99107591.9
DATE OF FILING	(22):	19990521
ADDITION TO	(61):	
INTERNATIONAL CLASSIFICATION	(51):	A61K 35/74; C12N 1/20
PRIORITY	(30):	
INVENTORS	(72):	Yang Mengjun; Yang Jianshe; Chen Guisheng
APPLICANT	(71):	Beijing Zhong Wei Hua Mei Medical Technology Development Co., Ltd.
DESIGNATED CONTRACTING STATES	(81):	
TITLE	(54):	THE APPLICATION OF PHOTOSYNTHESIS BACTERIA FOR MEDICINE HEALTH PRODUCTS, THEIR MANUFACTURING METHOD AND PRODUCTS
FOREIGN TITLE	(54A):	GUANG HE XI BAO ZUO WEI YI YAO BAO JIAN PIN DE YING YONG JI QI ZHI ZUO FANG FA JI QI CHAN PIN

CLAIMS

/i*

1. This is the application of photosynthesis bacteria to make medicine health products wherein Rhodospirillaceae, which belongs to the Rhodospirillum family and Rhodospirillum genus, is inoculated and cultivated and made into live bacteria preparations, sterile preparations or capsules to be used as medicine health products for anti-ageing, cancer prevention, strengthening immunity, lowering fat and weight loss, anti-fatigue, increasing intelligence, and treating ulcers.

2. The special characteristic of the method of medicine health products mentioned in Claim 1 is that this method includes the following procedures:

(1) Prepare a culture medium based on the following weight fraction ratios:

Sugar:	190-200 parts
Potassium dihydrogen phosphate:	4.5-5 parts
Disodium hydrogen phosphate:	4.5-5 parts
Urea:	4.5-5 parts
Water-soluble starch:	4.5-5 parts
Peptone:	1.7-1.9 parts
Beef extract:	1.7-1.9 parts
Table salt:	1.9-2.1 parts
Maltodextrin:	46-49 parts
Composite amino acid:	1-1.1 parts
Adenosine triphosphate:	0.18-0.22 parts
Vitamin D:	1.9-2.1 parts
Sodium carbonate:	1.9-2.1 parts
Tocopheryl:	1.9-1.1 parts
Lipoid:	1.9-2.1 parts
Distilled water:	2955-3005 parts

* Numbers in the margin indicate pagination in the foreign text.

(2) A culture of Rhodospirillaceae with 60-90 weight fraction was inserted in the above culture medium, it was cultured for 7-15 days under full illumination conditions, and when the culture fluid reached 100-120 million per milliliter of Rhodospirillaceae, we made a Rhodospirillaceae live bacteria preparation.

3. The special characteristic of the method of medicine health products mentioned in Claim 2 is that this method also includes the following procedures:

(3) The above-mentioned Rhodospirillaceae fluid was deactivated for 10-20 minutes at 120-125°C whereby a Rhodospirillaceae sterile preparation was made.

4. The special characteristic of the method of medicine health products mentioned in Claim 2 is that this method also includes the following procedures: /ii

(3) A proportioning of 3-5 grams of coagulating agent was added into the above-mentioned Rhodospirillaceae culture fluid on the basis of each liter of culture fluid, and after filtering, it was dried for 25-30 minutes at a temperature of 55°C-59°C whereby bacteria powder of Rhodospirillaceae was made and filled into capsules.

5. The special characteristic of the Rhodospirillaceae live bacteria preparation made using the method mentioned in Claim 2 is that the content of the Rhodospirillaceae live bacteria in the said Rhodospirillaceae live bacteria preparation was 100-120 million/ml.

6. The special characteristic of the Rhodospirillaceae sterile preparation made using the method mentioned in Claim 3 is that that the content of the Rhodospirillaceae in the said Rhodospirillaceae sterile preparation was 100-120 million/ml.

7. The special characteristic of the Rhodospirillaceae capsules made using the method mentioned in Claim 4 is that that the content of the Rhodospirillaceae in the said Rhodospirillaceae capsules was 100-120 million/ml.

The Application of Photosynthesis Bacteria for
Medicine Health Products, Their Manufacturing Method and Products

This invention involves the application of photosynthesis bacteria for medicine health products, their manufacturing method and products.

Photosynthesis bacteria (PSB) is one type of hydrosphere microbe that is widely distributed in oceans, lakes, rivers, paddy fields, sludge, soil, and various other locations, they are distributed in the anaerobic atmosphere of water, and synthesize their own nutrient substances by carrying out anoxygenic photosynthesis. There are four families of photosynthesis bacteria: Rhodospirillaceae, Chromatiaceae, Chlorobiaceae, and Chlorolexaceae. To date, there are a total of 4 families, 22 genus and 61 species of known photosynthesis bacteria that have been isolated. At present, there has not been much development and application of photosynthesis bacteria.

The aim of this invention is to provide an application of a type of photosynthesis bacteria for medicine health products, a method for the manufacture of medicine health products as well as the medicine health products that are made. These medicine health products can resist ageing, prevent and treat cancer, strengthen immunity, lower fat and reduce weight, resist fatigue, increase intelligence, and treat ulcers.

In order to realize the above aims, the following technical plan was adopted for this invention: the application of a type of photosynthesis bacteria to be made into medicine health products, it is inoculated and cultivated as Rhodospirillaceae which belongs to the Rhodospirillum family and Rhodospirillum genus, and made into live bacteria preparations, sterile preparations or capsules to be used as medicine health products for anti-ageing, cancer prevention, strengthening immunity, lowering fat and weight loss, anti-fatigue, increasing intelligence, and treating ulcers. The Rhodospirillaceae used in this invention was made public and provided by the Shanghai Dong Feng Ecological Research Institute.

The method for manufacturing the Rhodospirillaceae living bacteria preparation of this invention includes the following procedures:

(1) Prepare a culture medium based on the following weight fraction ratios:

Sugar:	190-200 parts
Potassium dihydrogen phosphate:	4.5-5 parts
Disodium hydrogen phosphate:	4.5-5 parts
Urea:	4.5-5 parts
Water-soluble starch:	4.5-5 parts
Peptone:	1.7-1.9 parts
Beef extract:	1.7-1.9 parts
Table salt:	1.9-2.1 parts
Maltodextrin:	46-49 parts
Composite amino acid:	1-1.1 parts
Adenosine triphosphate:	0.18-0.22 parts
Vitamin D:	1.9-2.1 parts
Sodium carbonate:	1.9-2.1 parts
Tocopheryl:	1.9-1.1 parts
Lipoid:	1.9-2.1 parts

/2

Distilled water:

2955-3005 parts

(2) A culture of Rhodospirillaceae with 60-90 weight fraction was inserted in the above culture medium, it was cultured for 7-15 days under full illumination conditions, and when the culture fluid reached 100-120 million per milliliter of Rhodospirillaceae, it was made into a Rhodospirillaceae live bacteria preparation.

This method of preparing the Rhodospirillaceae sterile preparation of this invention also includes the following procedures on the basis of making the above-mentioned culture fluid:

(3) The above-mentioned Rhodospirillaceae culture fluid was deactivated for 10-20 minutes at 120-125°C whereby a Rhodospirillaceae bacteria sterile preparation was made.

This method of preparing the Rhodospirillaceae capsules of this invention also includes the following procedures on the basis of making the above-mentioned culture fluid:

(3) A proportioning of 3-5 grams of coagulating agent was added into the above-mentioned Rhodospirillaceae culture fluid on the basis of each liter of culture fluid, and after filtering, it was dried for 25-30 minutes at a temperature of 55°C-59°C whereby bacteria powder of Rhodospirillaceae bacteria was made and filled into capsules. Calcium sulfate was used as the coagulating agent.

The content of the Rhodospirillaceae live bacteria in the said Rhodospirillaceae live bacteria preparation made in this invention was 100-120 million/ml.

The content of the Rhodospirillaceae live bacteria in the said Rhodospirillaceae sterile preparation made in this invention was 100-120 million/ml.

A suitable amount of flavoring material could be added and directly inserted into the live bacteria preparation and sterile preparation so as to satisfy people's taste.

The content of the Rhodospirillaceae in the said Rhodospirillaceae capsules made in this invention was 100-120 million/ml.

Each 100 grams of Rhodospirillaceae bacteria powder made in this invention contained:

Component	Unit	Contents
Crude protein	%	65.45
Refined fat	%	7.16
Soluble sugar	%	20.31
Coarse fiber	%	2.78
Ash content	%	4.28
VB1	mg/g	12
VB6	mg/g	5
VB12	mg/g	12
Nicotinic acid	mg/g	125
Pantothenic acid	mg/g	30
Folic acid	mg/g	60
Biotin	mg/g	65

/3

The alkali protein in 65.45% of the protein contains 38.81% of the macromolecular weight (over 20000), the biotin is more than 4

times and 2 times higher than the 1.5mg/g of *Astragalus mongholicus* and 2.8mg/g of ginseng, and the macromolecular alkali protein is a crucially important equilibrium source of human body elementide.

In addition, Rhodospirillaceae bacteria contain active trace elements, and this is especially effective for supplementing trace elements needed in the human body.

The Rhodospirillaceae bacteria of this invention are applicable for the following fields of medicine health:

1. Applicable for anti-ageing: the applicants carried out survival tests on mice wherein we took 50 pure bred mice, randomly divided them into groups, reared them at room temperature of 25°C, maintained irradiation of natural light source every day, fed them with conventional mouse feed, gave the same conditions to both the Rhodospirillaceae live bacteria preparation group and control group, and counted up the number of mice that died each day until all of them died naturally. The results were that the average lifespan and highest lifespan of the Rhodospirillaceae live bacteria preparation group were significantly better than the control group; we determined the hydroxyproline concentration of the tail tendons of the mice and also proved that the Rhodospirillaceae live bacteria preparation had significant anti-ageing effects. The main anti-ageing mechanism of the Rhodospirillaceae live bacteria preparation was that the Rhodospirillaceae bacteria was able to eliminate the cell ageing

factor of the human body - the superoxide free radical and hydroxyl free radical reached to over 90%.

2. Applicable for cancer prevention and treatment: laboratory research by the applicants shows that Rhodospirillaceae inhibited the lactate dehydrogenase of test animals and its isodynamic enzyme, and raised in vivo catalase and activity. The occurrence of tumors is closely related to the overproduction of free radicals. Reducing the production of free radicals and maintaining the balance of oxidation and anti-oxidation in organisms is a rational means for preventing the occurrence of tumors, and catalase is one of the important enzymes for eliminating free radicals in the human body. Catalase mainly exists in hepatic and red blood cells, and its content is relatively small in the brain, heart and skeletal muscles. The activity of the catalase of animal serum begins to decline during the early stage of induced cancer and the activity further declines after the formation of cancer. After effective treatment with Rhodospirillaceae preparation or capsules, enzyme activity gradually returned to normal level and the cancer cells were effectively inhibited.

3. Applicable for strengthening immunity: the applicants employed the various test methods of non-specific immunity, body fluid immunity and cell immunity, and carried out observations. Non-specific immunity was used to test the immune organ weight method,

thymus gland and spleen cell count, and peripheral blood cell count; body fluid immunity was used to test the determination of hemolysin; cell immunity was used to test the peripheral blood T lymphocyte count and lymphocyte transformation test, and it was proven that Rhodospirillaceae bacteria possess the activity to regulate immunity (especially strengthening immunity functions). /4

4. Applicable for lowering fat and weight loss: research by the applicants has proven that Rhodospirillaceae bacteria can lower the ester contents of the total cholesterol and total glycerin in serum, increase the HPL contents, lower the LPL contents, lower the arterial stiffness index, and raise the LCAT activity. When Rhodospirillaceae preparation or capsules are used to treat obesity, protein foods with high biological value are employed to increase the oxidizing process of fat in the body, draw upon the stored fat and decrease the accumulation of fat, and at the same time Rhodospirillaceae is rich in active substances that can block the absorption of fat and cholesterol, it possesses physiologically regulating functions, and it is a relatively ideal food for weight loss.

5. Applicable for exercise and resisting fatigue: the applicants discovered through research that the mechanism of the occurrence of fatigue is on the one hand the depletion of energy substances and on the other hand when acidic metabolic products as represented by lactate work in anaerobic muscle, the concentration is greatly increased, and even more important, during strenuous exercise, human

tissue will produce large quantities of free radicals as a result of ischemia and reperfusion. Free radicals are highly active molecules that have certain destructive effects on tissue cells. Free radicals can change the fine structure of the sarcoplasmic reticulum, and it can directly affect the dehydrogenation of Ca^{2+} -- Mg^{2+} -- ATP enzymes so that the functions of the sarcoplasmic reticulum decline causing an increase of the concentration of Ca^{2+} in endochylema. The high concentration of Ca^{2+} in endochylema can induce large absorption of Ca^{2+} by mitochondria, the large accumulation of Ca^{2+} by mitochondria can inhibit cellular respiration and cause hydrogenated phosphorylation decoupling which greatly decreases the resynthesis rate of ATP and results in inadequate working functions of muscles ultimately causing fatigue. Rhodospirillaceae bacteria can supplement large amounts of energy, eliminate acidic products accumulated through metabolism in the body, eliminate free radicals, the anti-fatigue effects in animal tests were noticeable, and it is the most ideal anti-fatigue function food and new generation sports food.

6. Applicable for increasing intelligence: the normal functions of the brain are determined by sufficient numbers of cerebral neurons and its synthesized and secreted sufficient quantities of neurotransmitters. Research of the applicants has proven that the influences of Rhodospirillaceae on intelligence are mainly due to its many active substances being the precursors of certain neurotransmitters, and they are also the bioactive substances for the

development and functional activities of the nervous system. We used reflex tests on animals under passive avoidance conditions, such as the step down test and step through test; and reflex tests mainly under avoidance conditions such as the shuttle box, maze test and other test research, and it was discovered that Rhodospirillaceae possesses significant intelligence increasing functions.

We carried out the following tests using Rhodospirillaceae in the field of toxicology:

1. Acute toxicity tests were used to determine the LD50, and the results were that the LD50 dosage of Rhodospirillaceae was over 300 times greater than the possible intake amount by the human body.

2. There were no toxic effects discovered with short-term feeding tests.

The health examinations and physico-chemical differentiation of the live bacteria preparations and capsules of Rhodospirillaceae were as follows:

1. Health physico-chemical examination indices:

Item	Rhodospirillaceae	
	Culture Live Bacteria	Dry Powder Capsule Preparation
Lead	Not detected	Not detected
Arsenic	Not detected	Not detected
Chlorine	Not detected	Not detected
Other Pollutants	Not detected	

/5

2. Microbe indices:

Rhodospirillaceae live bacteria preparation

Total number of colonies	<100
Coliform group	<10
Toadstools	Not detected
Yeast	Not detected
Pathogenic bacteria	Not detected

3. Differentiation of physico-chemical properties

Item	Special Characteristic	Conclusion
PH value	9.5	Alkaline
Molecular weight	25000	Macro-molecular
Electrophoresis	4 boundaries	Many types of proteins and amino acids
Dissolution	Does not dissolve in	High water, dissolves polymer slightly in alcohol protein acetamidine and benzene
Firing	Protein odor, turns	Protein black odor
Stored in air	No changes	Does not for 48 hours absorb moisture, easy to keep
Detection of	Issued blue light	Alkaline fluorescence biotin
Taste	Salty, no mixed taste	Alkaline
Smell	No smell	Normal
Trace elements	Contains iron, zinc, Various	manganese, sulfur, trace calcium elements

Example of Implementation

The culture medium was prepared based on the following weights:

Sugar:	195.2kg
Potassium dihydrogen phosphate:	4.76kg
Disodium hydrogen phosphate:	4.76kg
Urea:	4.76kg
Water-soluble starch:	4.76kg
Peptone:	1.8kg
Beef extract:	1.8kg
Table salt:	2kg
Maltodextrin:	47.6kg
Composite amino acid:	0.9kg
Adenosine triphosphate:	0.2kg
Vitamin D:	2kg
Sodium carbonate:	2kg

/6

Tocopheryl:	1kg
Lipoid:	2kg
Water:	3000kg

90kg of Rhodospirillaceae was inserted, it was cultured for 7-15 days under full illumination conditions, and when the contents of Rhodospirillaceae reached 100-120 million per milliliter, it was qualified.

The above-mentioned culture fluid was added into a suitable amount of flavoring material and directly inserted to make a live bacteria preparation; or the above-mentioned culture fluid was deactivated at 120°C, added into a suitable amount of flavoring material, and inserted to make a sterile preparation, or the above-mentioned culture fluid was added into 3-5kg of the coagulating agent calcium sulfate, and after filtering, it was dried for 25 minutes at a temperature of 58°C wherein a dry powder of Rhodospirillaceae was obtained, it was directly filled into the capsules, and each capsule was 0.5g.